

CLAIMS

What is claimed is:

1. An optical pickup apparatus comprising:
a first light source to generate a first light beam;
a second light source to generate a second light beam whose optical axis is parallel to the optical axis of the first light beam, the second light source being disposed optically farther from a recording medium than the first light source;
a photodetector to receive the first light beam and the second light beam which are emitted from the first and second light sources, respectively, and which are reflected from the recording medium and performing photoelectric conversion;
an objective lens to focus the first light beam and second light beam on the recording medium, the objective lens being disposed on an optical path between the first and second light sources and the recording medium; and
a beam splitter disposed on an optical path between the objective lens and the photodetector, the beam splitter having a first surface to reflect the first light beam and the second light beam toward the objective lens and simultaneously transmitting the first light beam and the second light beam, and a second surface on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface.
2. The optical pickup apparatus according to claim 1, wherein the hologram is formed to diffract the first light beam into a relatively more +1-order diffracted light beam and relatively less residual light, and diffracting the second light beam into a relatively more zero-order diffracted light beam and relatively less residual light.
3. The optical pickup apparatus according to claim 2, wherein the first surface is set such that the first light beam and the second light beam are incident thereon at an angle of 45° .
4. The optical pickup apparatus according to claim 3, further comprising a coating formed on the first surface so that approximately 50% of the first light beam is reflected and approximately 50% thereof is transmitted.

5. The optical pickup apparatus according to claim 3, wherein the coating is formed on the first surface so that approximately 50% of the second light beam is reflected and approximately 50% thereof is transmitted.

6. The optical pickup apparatus according to claim 3, wherein the hologram is formed such that the +1-order diffracted light beam is at least 70% as much as the first light beam.

7. The optical pickup apparatus according to claim 3, wherein the hologram is formed such that the zero-order diffracted light beam is at least 70% as much as the second light beam.

8. The optical pickup apparatus according to claim 1, further comprising a collimating lens on an optical path between the beam splitter and the objective lens.

9. The optical pickup apparatus according to claim 1, further comprising a concave lens on an optical path between the beam splitter and the photodetector.

10. A method of compensating for a deviation between optical axes of light sources, the method comprising:

applying a voltage to one of the light sources to cause a light beam to be emitted;

allowing the emitted light beam to be reflected from a first surface of a beam splitter, transmitted through an objective lens, focused on a recording medium, and reflected from the recording medium;

allowing the light beam reflected from the recording medium to be incident on a second surface of the beam splitter;

diffracting the light beam which is incident on the second surface of the beam splitter into a relatively more +1-order diffracted light beam and relatively less residual light when the light source emitting the light beam is optically closer to the recording medium than the other light source, and diffracting the light beam which is incident on the second surface of the beam splitter into a relatively more zero-order diffracted light beam and relatively less residual light when the light source emitting the light beam is optically farther from the recording medium than the other light source; and

focusing the zero-order diffracted light beam or the +1-order diffracted light beam transmitted through the second surface on a photodetector.

11. The method according to claim 10, wherein in the second operation, the light beam emitted from the light source is incident on the first surface of the beam splitter at an angle of 45°.

12. The method according to claim 10, wherein in the second, 50% of the light beam is substantially reflected from the first surface of the beam splitter.

13. The method according to claim 10, wherein in the fourth operation, the zero-order diffracted light beam is at least 70% as much as the second light beam.

14. The method according to claim 10, wherein in the fourth operation, the +1-order diffracted light beam is at least 70% as much as the first light beam.

15. An optical pickup apparatus comprising:
a first light source to generate a first light beam;
a second light source to generate a second light beam whose optical axis is parallel to the optical axis of the first light beam, the second light source being disposed optically farther from a recording medium than the first light source;
a photodetector to receive the first light beam and the second light beam which are emitted from the first and second light sources, respectively, and which are reflected from the recording medium and performing photoelectric conversion;
an objective lens to focus the first light beam and second light beam on the recording medium, the objective lens being disposed on an optical path between the first and second light sources and the recording medium; and
a beam splitter disposed on an optical path between the objective lens and the photodetector, the beam splitter having a first surface to reflect the first light beam and the second light beam toward the objective lens, and a second surface which receives the first and second light beams reflected from the recording medium, to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface.

16. The optical pickup apparatus according to claim 15, wherein the second surface comprises a hologram.

17. The optical pickup apparatus according to claim 15, further comprising a coating formed on the first surface so that a portion of the first and second light beams is reflected and the remaining portion of the first and second light beams is transmitted.

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